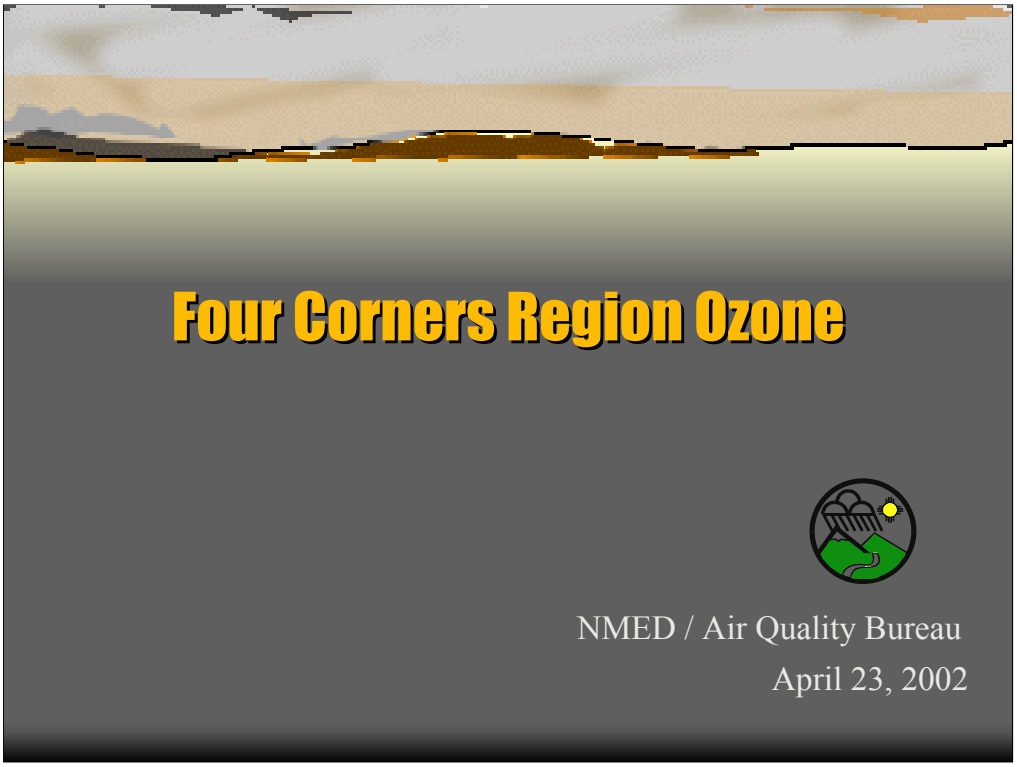

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Sandra Ely, Air Quality Bureau Chief, (505) 955-8091
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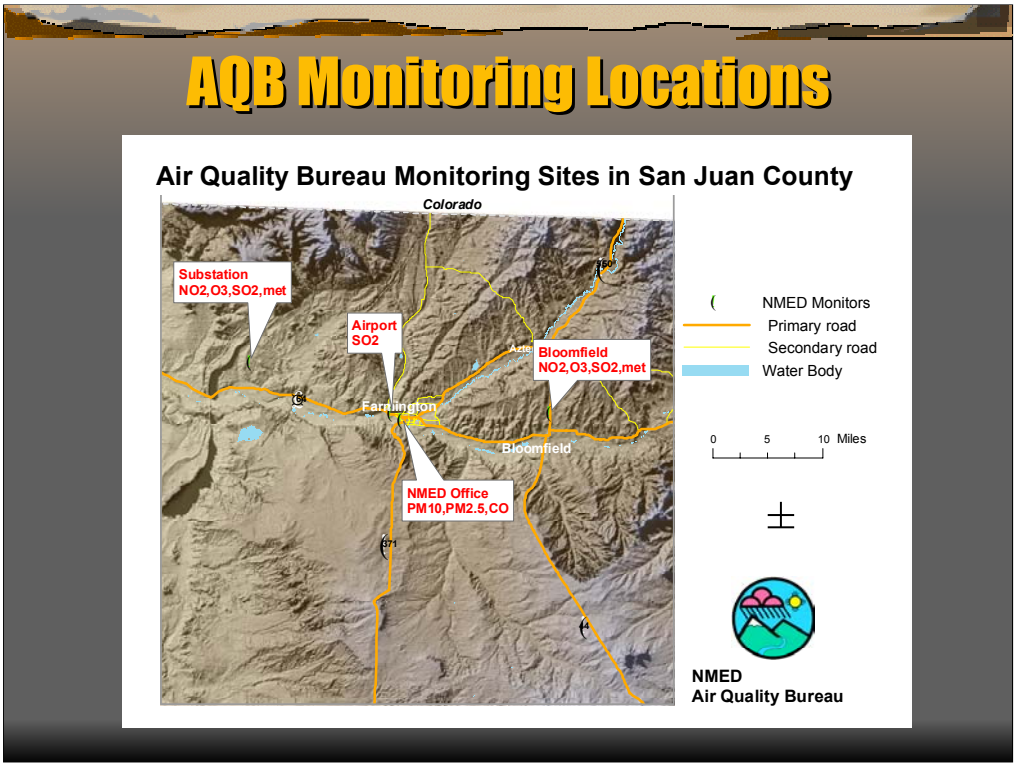


The Department has four monitoring sites in San Juan County. They don't all measure the same thing.

At the Farmington Airport we only have one sensor which measures Sulfur Dioxide.

We have two sensors at our Air Quality branch office in Farmington at 724 West Animas. These sensors measure "Particulate Matter" or the amount of dust in the air. There are two monitors because they measure different sizes of particles:

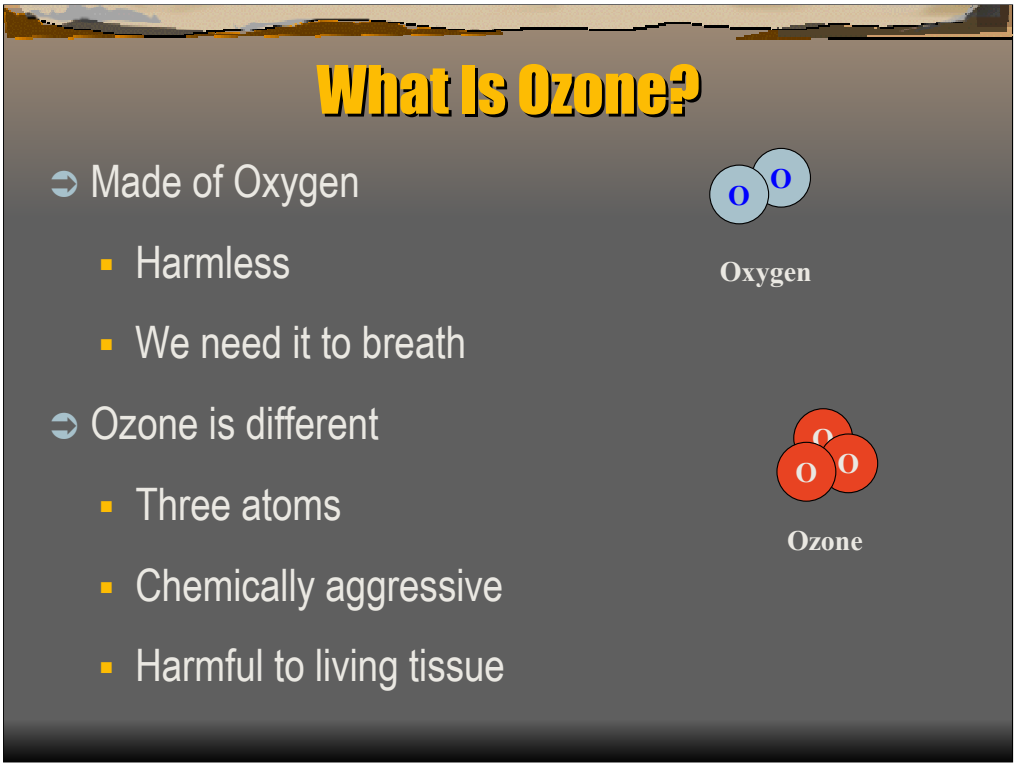
coarse dust, (anything less than 10 microns in diameter)

and very fine dust (anything less than 2.5 microns in diameter).

Of most interest this evening are the two sensors that measure ozone. We refer to these as the "Substation" monitor and the "Bloomfield" monitor.

The "Substation monitors" are west of Farmington near the PNM San Juan Generating Station. This location measures Sulfur Dioxide, Nitrogen Oxides, and Ozone concentrations.

The Bloomfield monitoring station is four miles north of the Bloomfield Gas Corridor. This site also measures Sulfur Dioxide, Nitrogen Oxides, and Ozone concentrations.



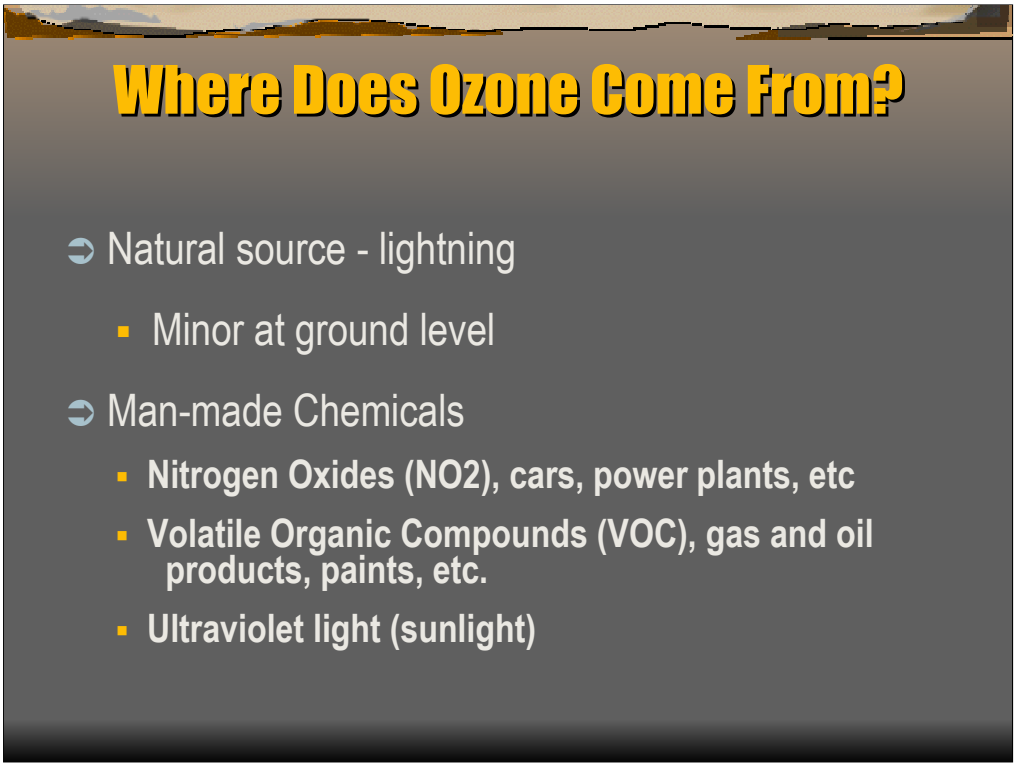
Ozone is made of oxygen: something that's in the air all around us.

The normal form of Oxygen is two atoms joined together. Normal oxygen is harmless. In fact, we need it to breath and live.

Ozone is different. Ozone has three oxygen atoms joined together.

Because the ozone molecule is highly reactive it is chemically aggressive.

Ozone damages plant and animal tissue. In fact Ozone is sometimes used to sterilize water, because in sufficient concentrations, it kills living organisms.



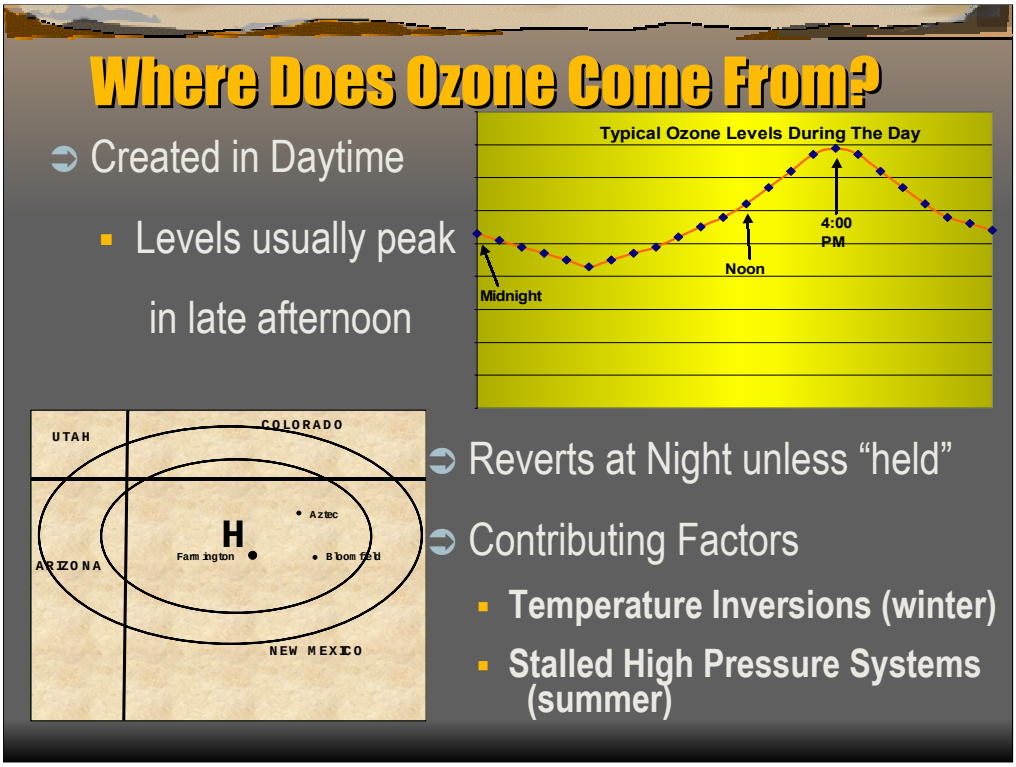
There are some natural causes of ozone. Lightning passing through the air creates some ozone. If the lightning strikes the ground, the 'brimstone' smell of ozone is sometimes observed in the immediate area for a brief time. Lightning is a rare event however, and contributes very little to high ozone levels in an area like San Juan County.

Most local ozone results from man-made chemicals, but unlike other air pollutants, Ozone is not emitted directly from a pollution source. Instead, ozone is formed from a combination of Nitrogen oxides and volatile organic compounds (VOCs). These emissions may come from many different sources.

Nitrogen Oxides come from many places but the largest sources are from car exhaust and industrial combustion.

Organic Compounds contain the element Carbon. The world 'volatile' means that they evaporate quickly into the air. Two simple examples of VOCs are gasoline and alcohol.

There are natural sources of VOCs in some areas. For instance, the "Blue Ridge Mountains" in Appalachia are named after the haze that results from the decay of massive amounts of vegetation on the forest floor. In a dry area like ours, however, limited water produces MUCH less vegetation and very slow decay.



Because it requires sunlight, Ozone is formed in the daytime. The process starts about mid morning when the sun's angle increases in the sky.

Ozone typically builds up all day long, reaching peak levels in the late afternoon.

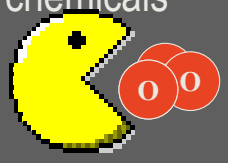
At night the process reverses and Ozone begins to break down. Ozone will also disperse into the surrounding air and move away with the local winds. Several things can stop this from happening.

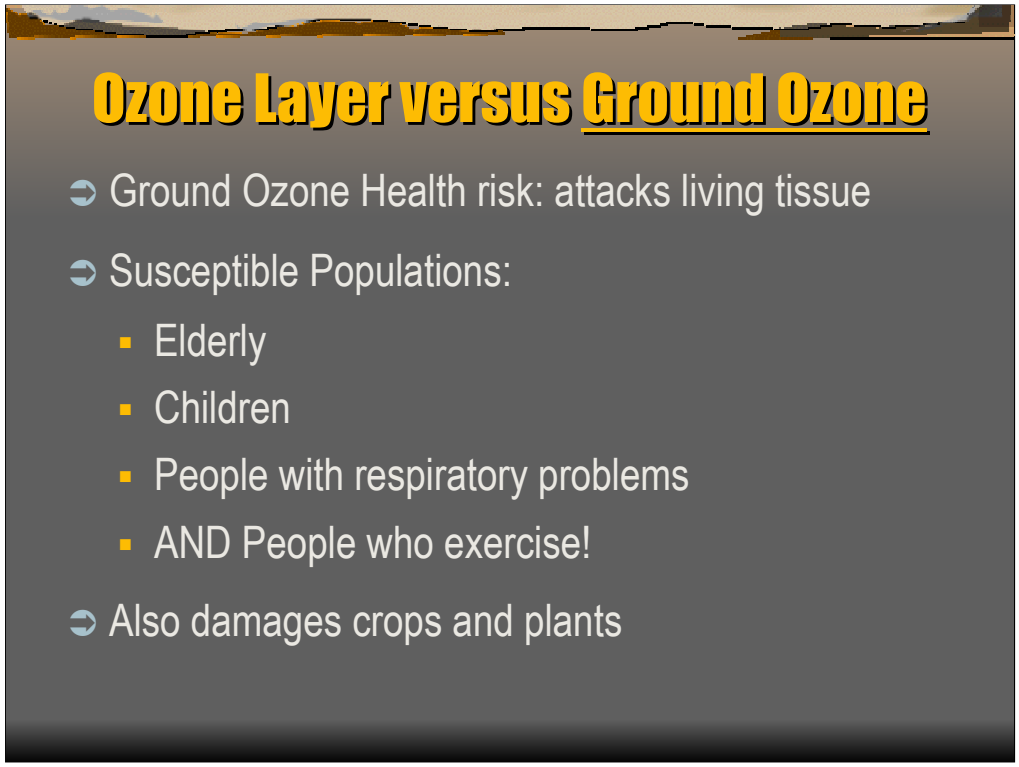
In the winter time, Temperature Inversions form (usually in evening and nighttime hours). The inversion can act as a "cap" over a city and hold the ozone in place that formed during the day. Some breaks down overnight, but because it can't move away, there is more left in the morning. Temperature Inversions usually break down the following day when the ground level air heats up.

In the summer time, a high pressure area will sometimes stall over an area with ozone and cause a similar effect. Stagnant "Highs" are more effective "ozone caps" because they can be in place day and night.

Ozone Layer versus Ground Ozone

- Ozone Layer
  - Very high - stratosphere
  - Protects us from ultraviolet light
  - Being destroyed by man-made chemicals
  - Freon (refrigerants)
- If sufficient damage is done -
  - Cancer levels could increase





Inhaling ozone, even at low concentrations, may trigger a variety of health problems. Some symptoms associated with ozone exposure include stinging eyes, chest pains, coughing, nausea, and throat irritation. Exposure to ozone can worsen bronchitis, heart disease, emphysema, asthma, and reduce lung capacity.

While Ozone can affect a wide range of people, particularly vulnerable groups include the elderly, young children, and those with asthma or other respiratory ailments.

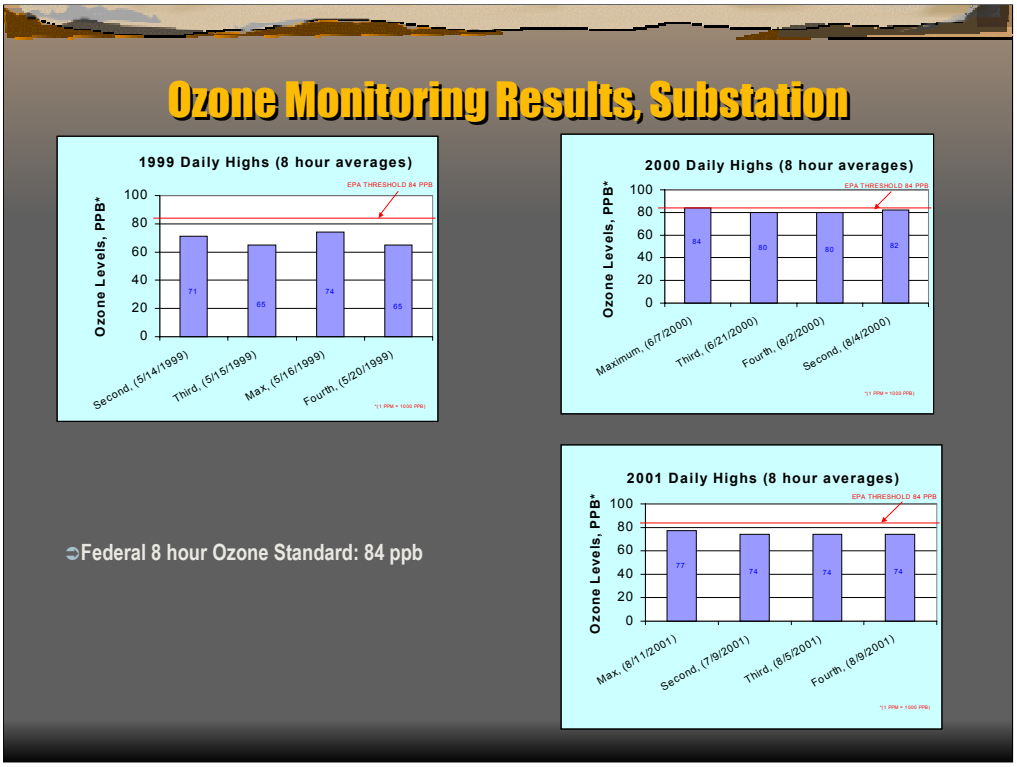
•Elderly people may have reduced lung capacity due to many factors experienced over a lifetime.

•Children are more sensitive to ozone because their respiratory systems are not fully developed, and they tend to breathe more per body weight than adults.

•People with respiratory diseases, such as asthma, generally experience the effects of ozone earlier and at lower levels than less sensitive individuals.

BUT THAT'S NOT ALL . . . Healthy people also experience breathing difficulty when there is lots of ozone in the air. Anyone who spends a lot of time exercising outdoors during the summer may be affected because they increase the amount of air (and ozone) that contact the lungs. Repeated exposure to ozone pollution may cause permanent damage to the lungs.

In addition to human health, Ozone can damage or kill plant and crop leaves so they become spotted or brown and produce lower yields.

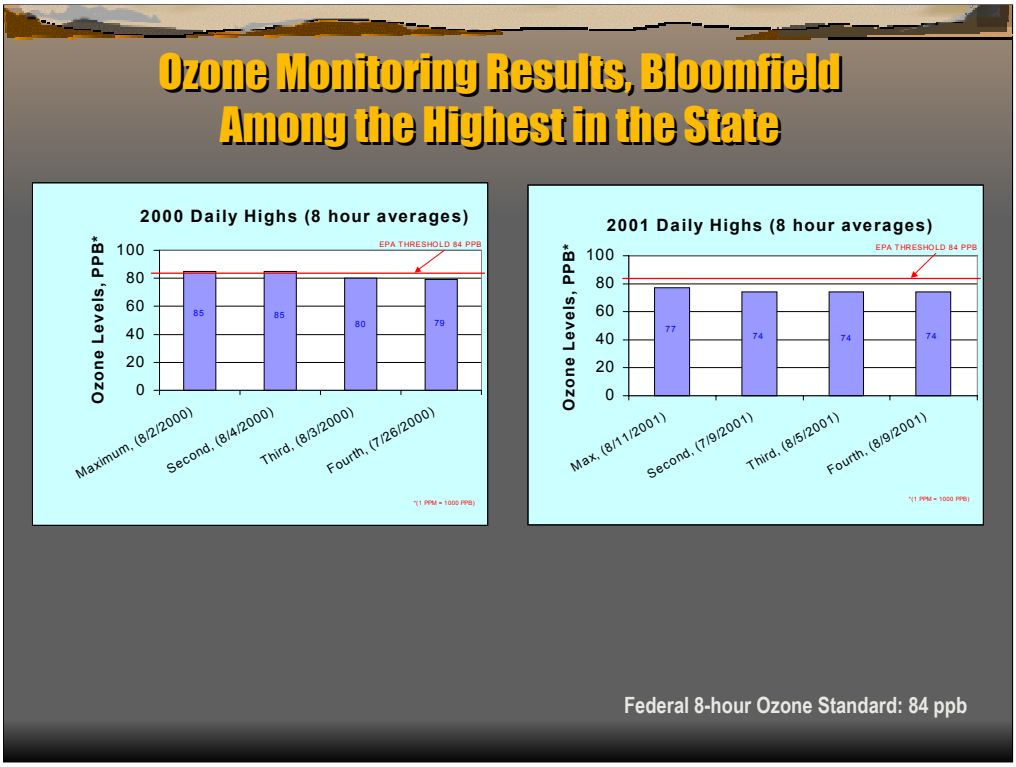


The National Ambient Air Quality Standard for ozone is .084 ppm (or 84 ppb) averaged over an 8 hour period. The federal standard was created in 1997 and was challenged in court. EPA issued a notice in the federal register that the standard would remain in effect while the matter was being resolved. In March, 2002, the EPA standard was upheld by the United States Supreme Court.

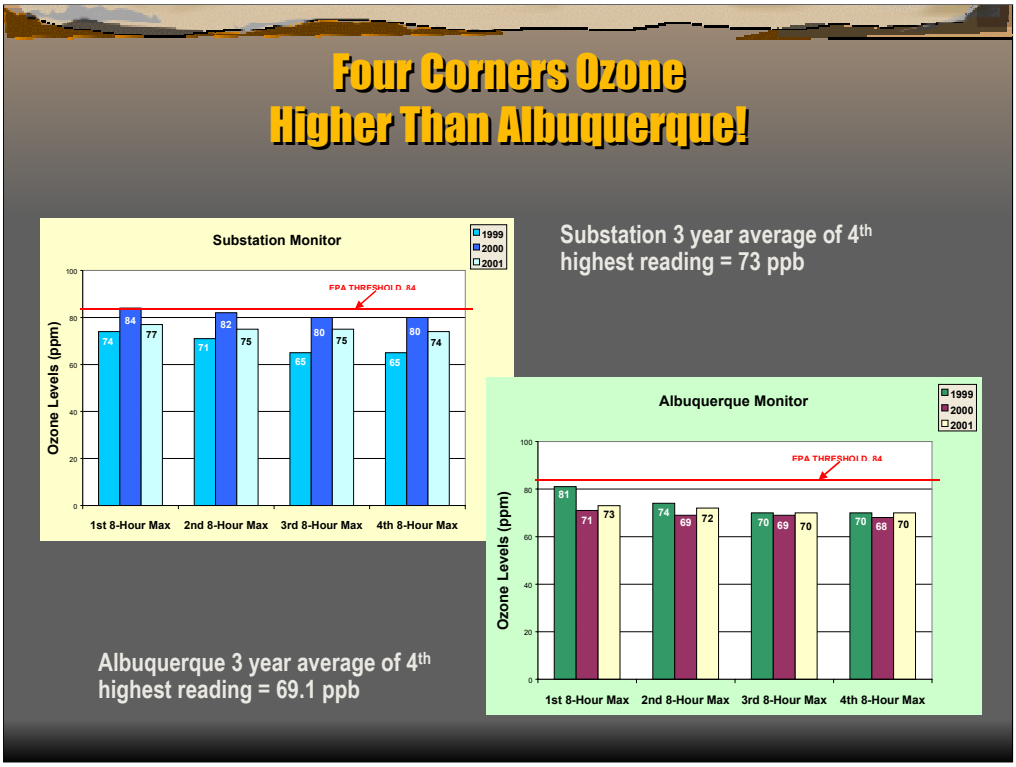
The Department started monitoring ozone levels in the NW part of New Mexico in 1997 at our Substation location. Later, in June of 2000, we installed a second ozone monitor at our Bloomfield site. The state averages the fourth highest eight-hour average for three consecutive years and compares this value to the federal standard

As you can see the area is very close to exceeding the federal standard for ozone. This is surprising, since areas that exceed standards for ozone are usually highly urbanized. Most ozone non-attainment in the US occurs in metropolitan areas with populations greater than a million.

There was quite a jump in ozone concentrations from 1999 to 2000 at the Substation site. Bureau staff have evaluated the dates on which the elevated levels occurred. Evidence indicates that stationary High Pressure Systems were involved, holding the pollution in place. However, this does not excuse or diminish the problem.



Bloomfield Ozone levels are even higher than at the Substation.

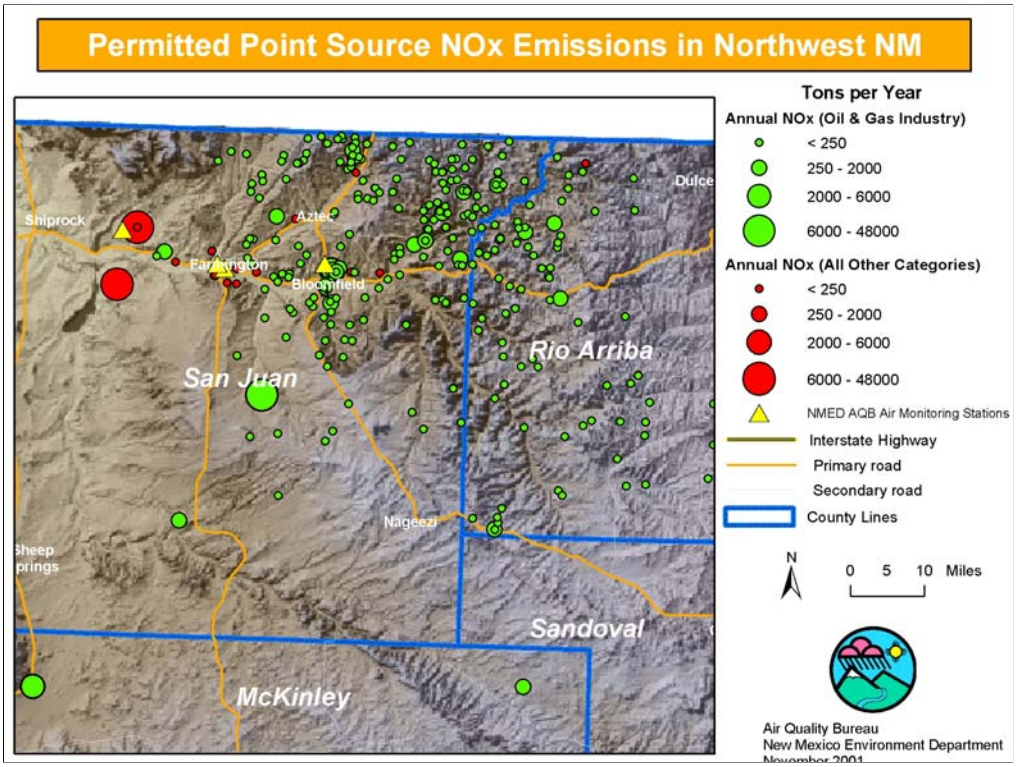


Like San Juan, Albuquerque measures Ozone at two locations. With more than one monitor, it is difficult to display and compare averages of averages. Therefore, this chart displays data from only one monitor in each location.

There is a 3- year history at the San Juan Substation monitor, which allows us to calculate the appropriate 3-year average of the 4th highest 8 hour average. The number is 73 ppb.

During the two years that the AQB been monitoring Ozone, Bloomfield readings are higher than the Substation. In order to make a fair comparison, the lower of the two Albuquerque monitors is displayed (3-year average = 69.1 ppb).

However, if the higher Albuquerque monitor had been used (3-year average = 71.7 ppb), it would still have been less than the Substation, which in turn is less than Bloomfield.



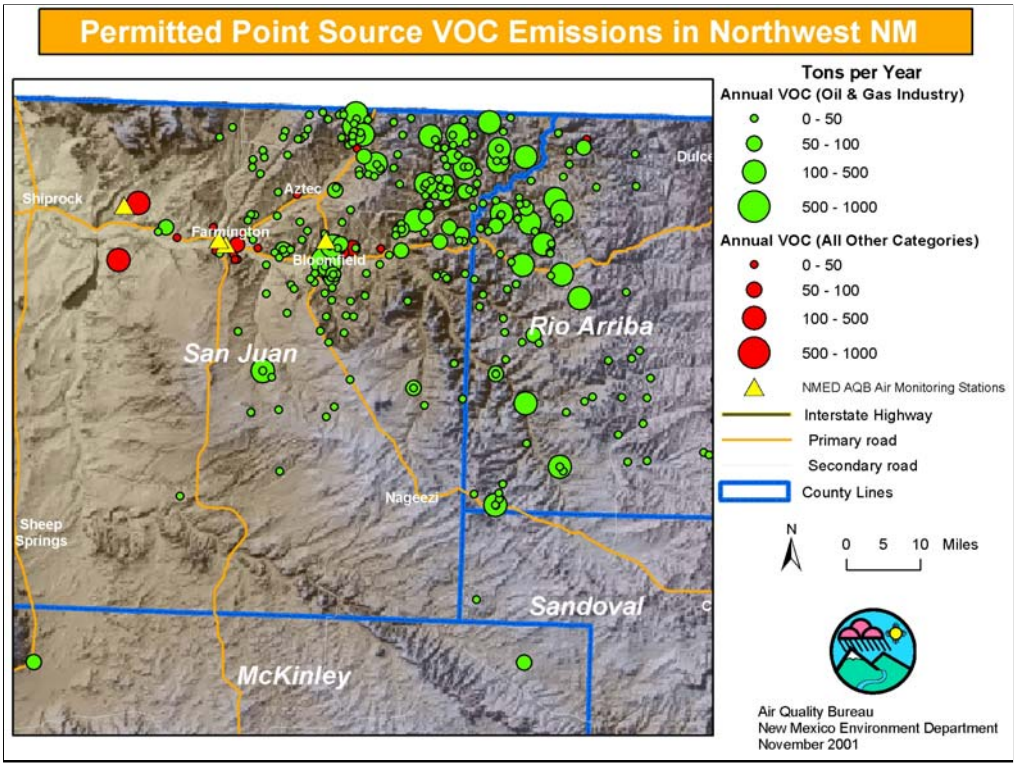
Nitrogen Oxides (NO2 or NOx) and Volatile Organic Compounds (VOCs) are called "Ozone precursors" because they react in the presence of ultraviolet light to form Ozone.

This map demonstrates the location and quantity of permitted NOx point sources in the NW corner of the state. The larger dots indicate more emissions from that site. Green dots are related to the Oil and Gas industry. All other sources are red.

Nitrogen Oxides are produced in large quantities by high temperature processes. For example, power plants change the form of natural nitrogen that is in the air. The large red dots are electrical power generating stations.

Internal combustion engines also produce Nitrogen Oxides. Many of the green sources shown above are engines that drive compressors.

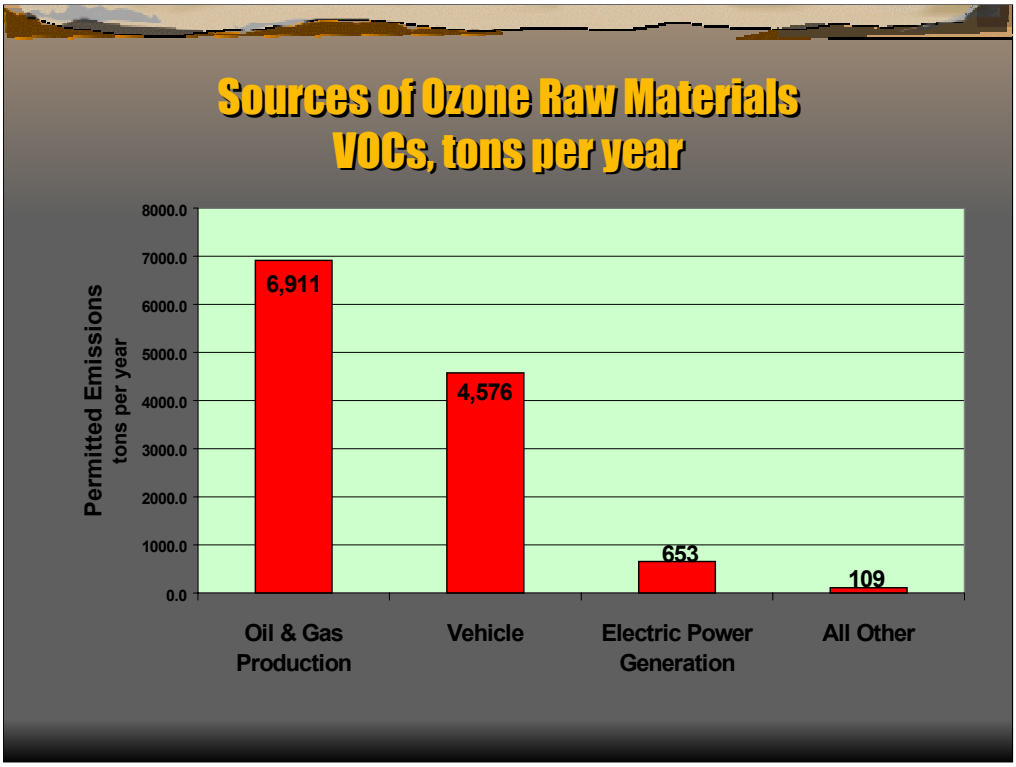
Note that this map shows ONLY the larger sources that might potentially emit more than 10 tons per year. That means that many smaller individual sources (for example, trucks, cars, or smaller compressors) could also be contributing to the problem and we wouldn't know about them.



This map shows the VOC point sources in the Four Corners area of New Mexico. VOC stands for Volatile Organic Compounds. Simple examples of VOCs are gasoline, rubbing alcohol, paint thinners and drying agents: things that will evaporate quickly into the air. Again, sources related to the Oil and Gas industry are green while all others are indicated by red

Many of the permitted sources shown above are compressor stations and oil and gas processing operations. The large electrical power plants (in red) are again fairly obvious, but while they are big, there aren't as many of them so their total emissions are smaller. Painting operations also emit VOCs, as do cars and trucks, but the contribution of these sources is smaller.

As I mentioned a minute ago, there may be many other small sources that could also be contributing to the problem. This map shows ONLY the larger sources that might potentially emit more than 10 tons per year. The combined total of these "invisible" sources might be even more significant than what we currently see!

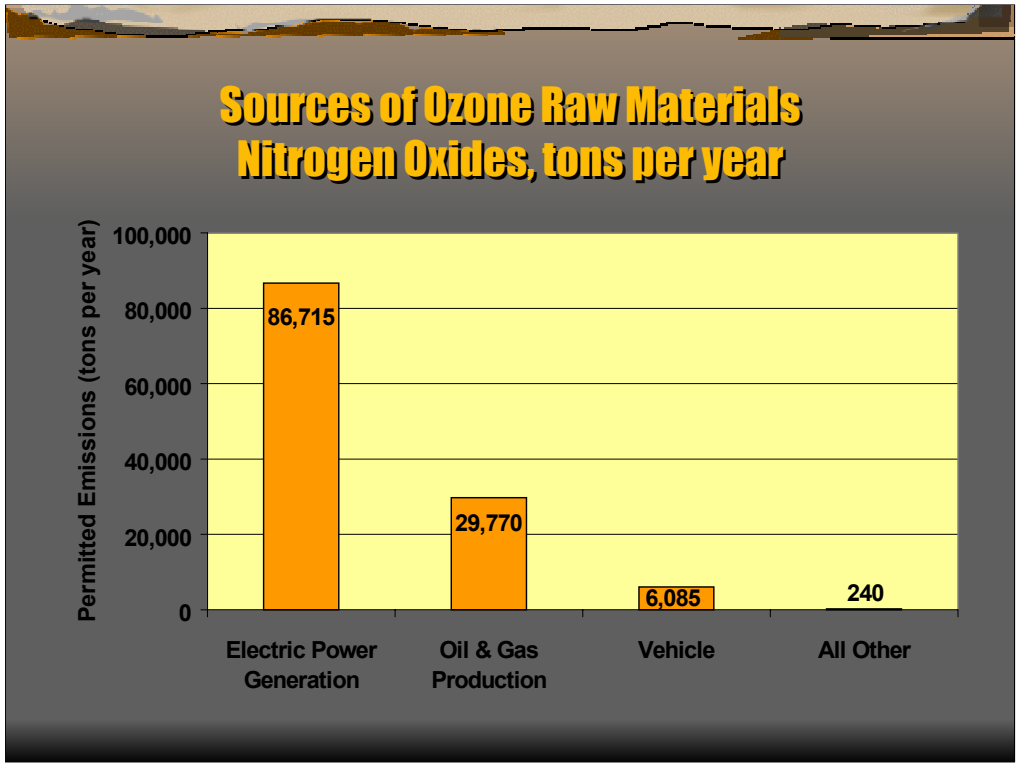


The Volatile Organic Compounds on this slide are from our most current emissions inventory (calendar year 2001) and represents allowable emissions. Allowable emissions are the maximum that a permitted facility can emit and still remain in compliance with their permit.

Oil and Gas contributes over half (56%) of the overall VOC emissions in the air shed. The next most significant source (37%) is vehicles, including non-road vehicles like tractors and bulldozers.

{Note that the vehicle emissions numbers are not from OUR data because we don't permit them. Vehicle emissions are ESTIMATES from the Western Regional Air Pollution (WRAP) database, based on factors like population, population density, vehicle licenses, agricultural significance, gasoline sales, etc.}

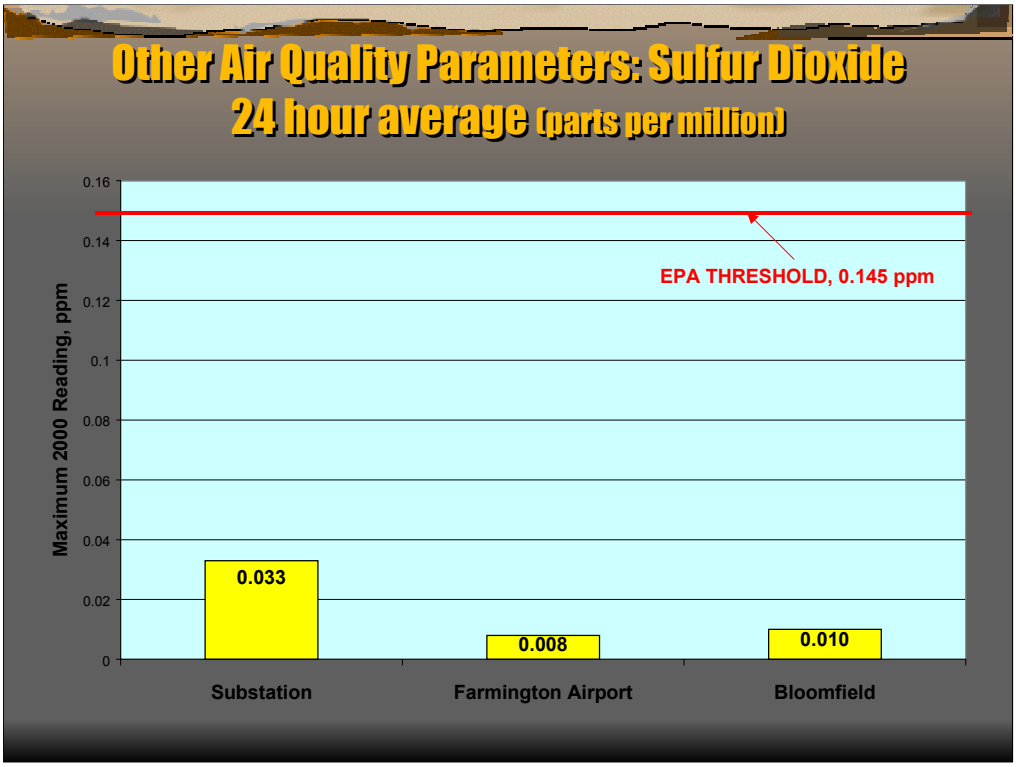
Our monitoring stations do not record VOC levels. VOCs are a large "family" of substances, not a single compound. Monitoring the entire group would be a complex task. The EPA regulates VOC emissions but does not require measurement of VOC concentration in the air.



The Nitrogen Oxide data on this slide is from our most current emissions inventory (calendar year 2001) and represents allowable emissions. Allowable emissions are the maximum that a permitted facility can emit and still remain in compliance with their permit.

Oil and Gas contributes about 25% of the overall NOx emissions in the air shed. The major source of NOx emissions (71%) is from the two power plants: Arizona Public Service Four Corners Power Plant and the Public Service Company of New Mexico's San Juan Generating Station. At 5%, vehicle emissions are insignificant.

The Substation and Bloomfield monitoring sites measure NO2 in addition to ozone. The NO2 concentrations at these sites are well below both the state or federal standards (state standard= .10 ppm, 24 hr average; federal standard= .05 ppm annual average). But Nitrogen oxides are still part of the Ozone equation and can't be ignored.



Here's the good news. Some things about San Juan County's air are are very good.

The National Ambient Air Quality Standard for Sulfur Dioxide is .145 ppm averaged over an 24 hour period.

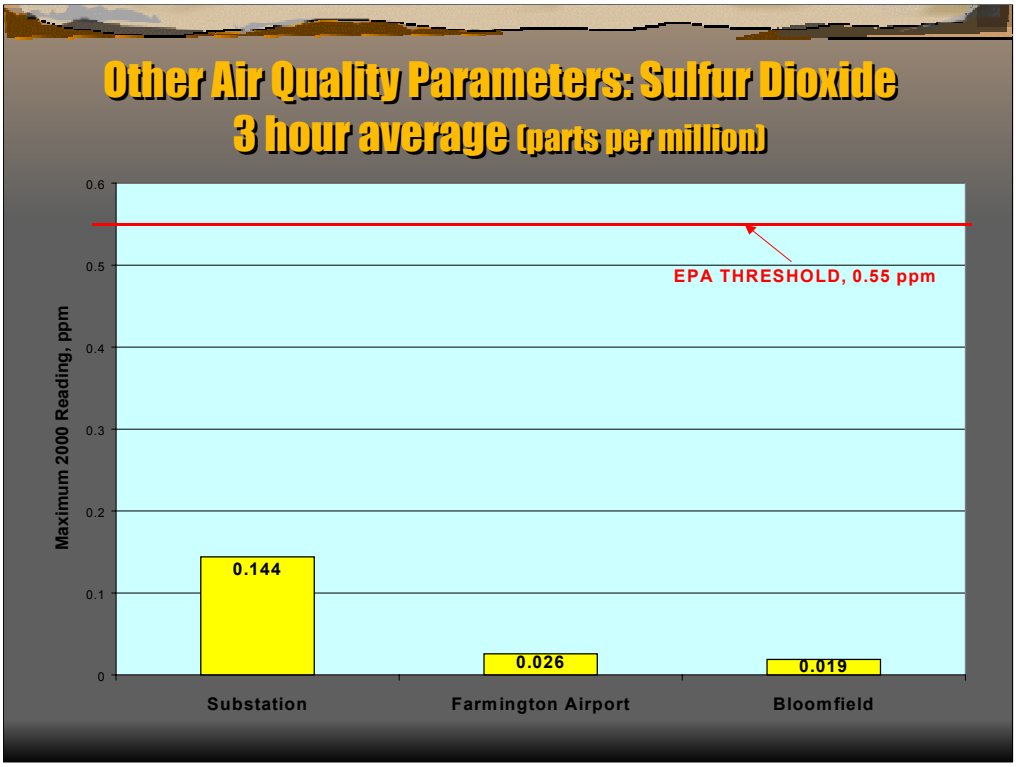
We monitor Sulfur Dioxide at three locations in San Juan County:

-At the substation

-At the Farmington Airport

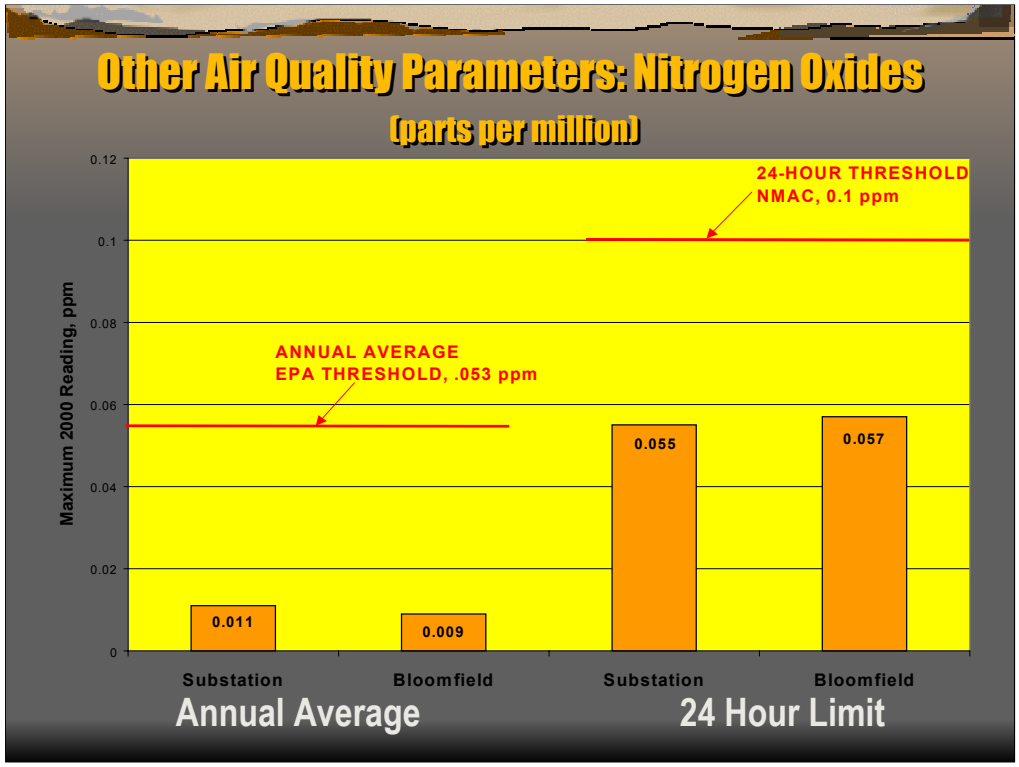
-And at the Bloomfield Corridor

Even if we look at the highest reading from each sensor for the year 2000, all three are well below the EPA Threshold.



For any 3-hour period, the National Ambient Air Quality Standard for Sulfur Dioxide is .55 ppm.

Again, all three sensors are well below the EPA Threshold for the year 2000.



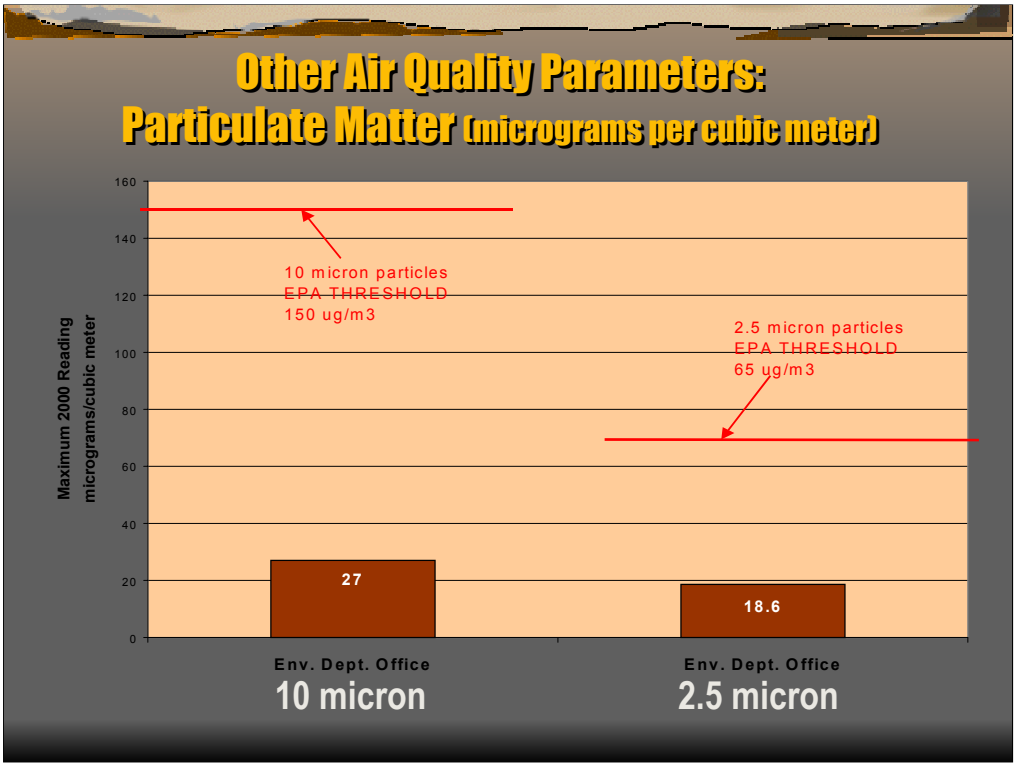
Nitrogen Oxides are one of the Ozone precursors.

The National Ambient Air Quality Standard for Nitrogen Oxides is .053 ppm averaged over an 8 hour period.

The state of New Mexico has a 24-hour average limit on Nitrogen Oxides, of 0.1 ppm.

We only monitor Nitrogen Oxides at two locations: the Substation Sensor and the Bloomfield.

Both sensors are well below the EPA Threshold for the year 2000, although it might be noted that they are proportionally higher than the Sulfur Dioxide that we just looked at.



Particulate matter is measured two ways:

-All particles less than 10 microns in diameter

-All particles less than 2.5 microns in diameter

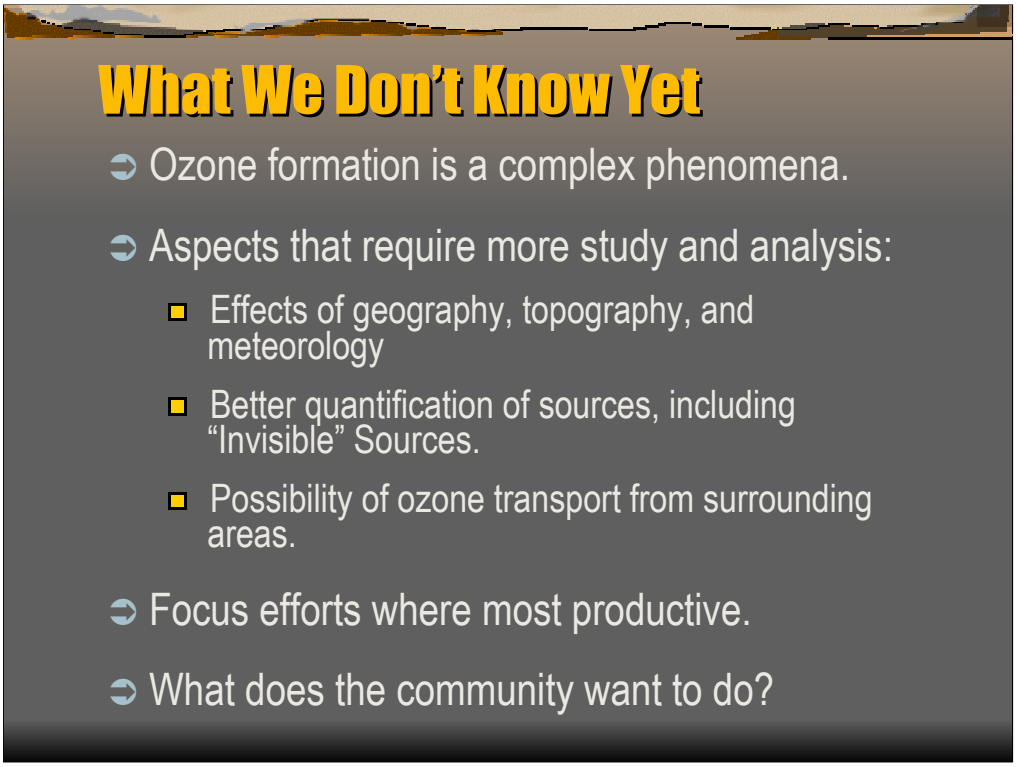
The National Ambient Air Quality Standard for 10 micron particulate matter is 150 micrograms per cubic meter, averaged over a 24-hour period.

The National Ambient Air Quality Standard for 2.5 micron particulate matter is 65 micrograms per cubic meter, averaged over a 24-hour period.

We only monitor Particulate Matter at one location, at our Air Quality office in Farmington.

Once again, the maximum readings for the year 2000 are well below the EPA Threshold.

So, there are some very positive things about San Juan County's air quality. It is good in many aspects. **The elevated Ozone levels appear to be a specific problem**.

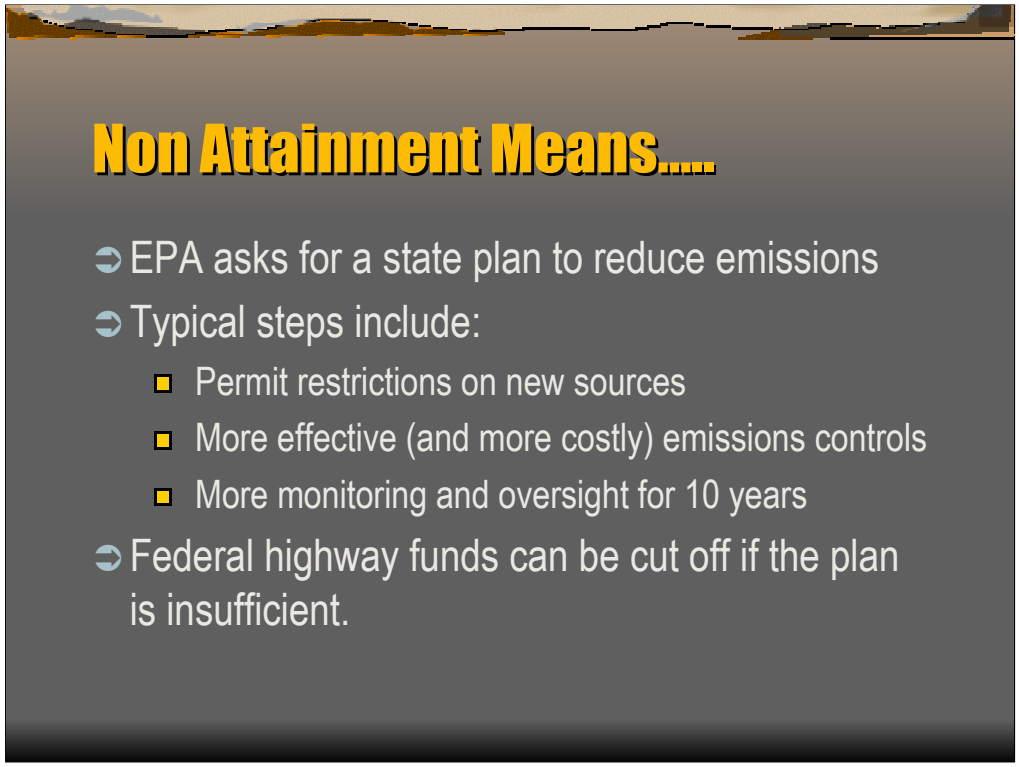


Eliminating Ozone isn't as simple as following footsteps back to a crime scene. The Ozone precursors, Nitrogen Oxides and Volatile Organic Compounds, come from many sources, some of which we may not have identified yet.

Ozone forms and decays under certain conditions. Computer models help to understand what is happening, but the modeling is complex. It takes lots of specific information, and a lot of time to be sure. We may need more monitors to help pinpoint the worst problems and sources.

The models will also help identify the best approaches to controlling Ozone precursors. Is it necessary to reduce Nitrogen Oxides, Volatile Organic Compounds, or do we have to work on both at once? Is the problem a few very big sources or many small ones?

What does the local community want to do? Since EPA and State standards haven't quite been exceeded yet, the problem could be ignored for a while. That might make the eventual solution more painful but it's your choice. A lot depends upon you. What future do you want for San Juan County?

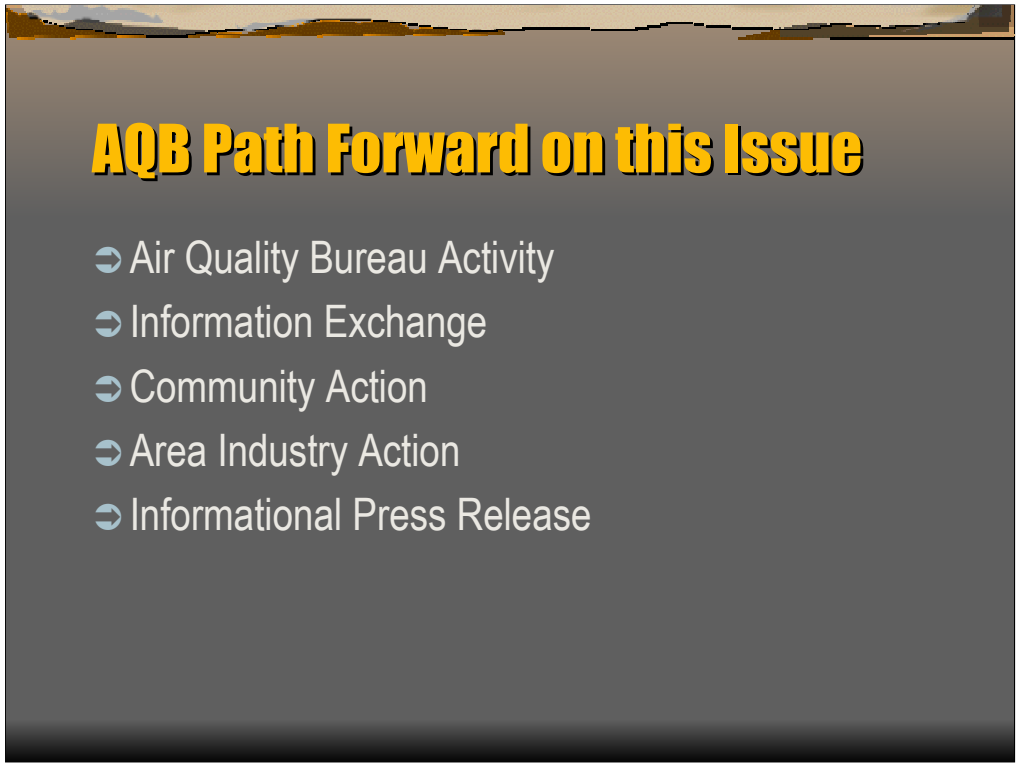


If an area within New Mexico measures violations of the federal ambient air quality standard, EPA could designate the area as non-attainment for ozone. EPA would require the state to submit a plan (State Implementation Plan or SIP) to bring the area back into attainment within 3 years.

If that goal is accomplished, we're not out of the woods yet. Next a maintenance plan must be created which is in effect for 10 years while progress is monitored. After the first 8 year, the area's pollution levels must be assessed and reported.

These steps are not taken to punish the area but to ensure that the air quality is cleaned up to a healthy level. An unintended side effect of the regulations, though, may be to slow economic growth. It becomes more difficult and more costly to do business in a nonattainment area.

The non-attainment designation can also affect business activities that do not produce large-scale pollution. The perception that an area is not a healthy place to live can hurt tourism, and lower population growth ripples through the whole economy.



Air Quality Bureau Activity: We are investigating the causes of elevated ozone levels and will recommend strategies for reducing Nox and VOC emissions in the Four Corners area. Because the federal standard is based on a three-year average of the fourth highest ozone concentration, several more years of data must be collected before we will know if this area will exceed ozone standards. In the meantime, the state air quality bureau will work with citizens, city, and county governments to address the potential problem in a proactive manner. Much analysis still has to be done but a few things are obvious. Reductions of Nox and VOC emissions from all sources in the four corners area will benefit the air quality of the region. The region's population is relatively small and very dispersed; thus, emissions from vehicles, households, and light commercial operations are probably not significant. The focus will probably be on emission reductions from stationary sources.

Information Exchange with EPA and neighboring states. Participation in EPA's "ozone flex" program may give the state credit for voluntary steps before the area has gone non-attainment.

Community: Support local efforts to reduce NOx and VOC emissions.

Area Industry Action: We are talking to the Oil and Gas and Utility industry about participating in voluntary activities to reduce NOx and VOCs. We also plan to use creative enforcement settlement agreements to reduce NOxs and VOCs. For example, there are a couple of new dehydrator designs that dramatically reduce VOC emissions. We have talked with some companies about installing these as a Supplement Environmental Project (SEP).

Information Press Releases: Additional data and results of the Farmington Ozone study will be publicly announced as soon as they are available.